REMARKS

Inventory of Claims

Applicant points out that the listing of claims appears to be inaccurate.

Non-elected claims 59, 60, 69, 76, and 79 were not cancelled in Applicant's response of Jan, 12, 2010 to the restriction requirement. Accordingly, those claims are withdrawn, but still pending and subject to rejoinder.

Claim amendments

Applicant amends claim 1 to recite the limitation of claim 7. Accordingly, claim 7 is cancelled, and claim 8 amended to replace its dependence on claim 7 with a dependence on claim 1. As amended, claim 1 now recites computing an *n*-dimensional warped signal from a received *n*-dimensional digital input signal.

Claim 72 is amended to eliminate means plus function language.

Section 103 Rejection of Claim 7

Le Pennec[1] teaches processing or compressing *n*-dimensional digital signals using foveal filtering along certain trajectories. *Le Pennec* does not perform a signal warping operation as claimed. One of ordinary skill in the art would have observed that all calculations to which *Le Pennec* refers are based on a regular sampling grid of the input signal. Accordingly, one of ordinary skill in the art would have found nothing in *Le Pennec* to suggest using a signal warping grid on which *n*-dimensional warped coefficients would be defined.

In rejecting claim 7, the Examiner states that one of ordinary skill in the art would have thought of the claim limitation based on col. 7, lines 18-22. The cited text reads as follows:

[1] *Le Pennec,* et al., US Patent No. 6,836,569.

FIG. 1 shows a system exemplifying the present invention. The system takes in input an n-dimensional digitized signal (**101**), where n is an arbitrary integer larger or equal to 2. It is given by an n-dimensional array of sample values. If n=2, the signal is an image. A trajectory finder (**102**) chooses trajectories over the n-dimensional support of the

One of ordinary skill in the art would have learned, from the cited text merely states that *Le Pennec*'s system receives an *n*-dimensional digitized input signal. He would have known nothing concerning what *Le Pennec*'s system actually does with that signal. In particular, he would have had no reason to think of using that input signal for "computing an *n*-dimensional warped signal."

The cited text further states that the signal is given by an *n*-dimensional array of sample values, which can represent an image if n=2, and that there exists a trajectory finder **102** that chooses trajectories over the *n*-dimensional support of the signal, along which signal information will be extracted. *Le Pennec*'s trajectory finder **102** does not provide any signal warping grid. Instead, it relies on a set of trajectory filters.[2] Accordingly, the Examiner's assertion that the cited text would have disclosed or suggested to one of ordinary skill in the art "computing an *n*-dimensional warped signal from" an *n*-dimensional input signal appears factually incorrect.

Le Pennec introduces a foveal trajectory processor **104**, which computes foveal coefficients **105**, and a foveal reconstruction processor **106**, which computes a foveal reconstruction signal.[3] The foveal trajectory processor **104** may use discrete foveal filters,[4] which may be based on discrete wavelet packets.[5] But again, this disclosure would not have suggested to one of ordinary skill in the art any warping operation by such discrete foveal filters.

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[2] *Le Pennec*, columns 13-14, FIG. 3

[3] *Le Pennec*, lines 28-38 of column 7.

[4] *Le Pennec*, column 10, line 52.

[5] Le Pennec, column 12, line 40.

If the Examiner maintains his assertion that *Le Pennec* discloses the additional limitation of claim 7, it would be most helpful if the Examiner could quote verbatim the particular words from *Le Pennec* that are believed to disclose or suggest this limitation.

Washizawa[6] teaches an image processing apparatus for high efficiency encoding and recognition of images or for feature detection. The binary tree structure shown in *Washizawa*'s FIG. 3 represents a local pattern in a multi-resolution space. However, *Washizawa* does not suggest using a binary tree in an *n*-dimensional warped wavelet packet transform applied to a warped signal including *n*-dimensional warped coefficients and *n*-dimensional signal warping grids. In fact, such an *n*-dimensional warped wavelet packet transform is neither disclosed nor suggested *Washizawa* or *Le Pennec*, either singly or in combination.

It is apparent that one of ordinary skill in the art would have had no basis, from inspection of the cited art, for learning the additional limitation of claim 7. Accordingly, amended claim 1 would not have been obvious to one of ordinary skill in the art in view of *Le Pennec* and *Washizawa*.

As motivation to modify the reference, the Examiner states that one of ordinary skill in the art would have found it obvious to modify *Le Pennec* to include applying an *n*-dimensional warped wavelet packet transform to a warped signal, with a binary tree where each node performs a one-dimensional warped subband processing along a respective dimension d, with $1 \leq d \leq n$ simply because "binary trees are well known to the invention of wavelet subband coding."

According to *KSR*,

> "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness"[7]

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[6] *Washizawa,* U.S. Patent No. 5,917,943.

[7] *KSR Intern. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007).

The Examiner's proposed reason for why one of ordinary skill in the art would have modified *Le Pennec* is nothing but a conclusory statement. The Examiner simply says that "binary trees are well known" in a particular field. The fact that something is well known is not a reason for making a modification. Many, if not most inventions are the result of combining well-known things.

The Examiner's proposed reason for modifying *Le Pennec* hardly rises to the level of "articulated reasoning with some rational underpinning." In fact, the Examiner's proposed reason for modifying *Le Pennec* is precisely the sort of conclusory statement that the Court in *KSR* forbids.

Claims 8, 11, 12, 17, 26, 38 and 44 all depend on claim 1 and are thus considered allowable at least for this reason. However, there exist other reasons for patentability of these claims. Some of these reasons are described below.

SECTION 103 REJECTION OF CLAIM 8

Dependent claim 8 requires that the signal warping grids be "computed from a warping geometry defined by region parameters specifying a partition of a signal support into a plurality of regions and deformation parameters specifying geometrical deformation functions respectively associated with said regions."

In rejecting claim 8, the examiner asserts that *Le Pennec* discloses the above limitation at column 7, lines 60-65 and column 8, line 26, column 9, line 36, where information about the trajectory lists is given.

However, the trajectory lists disclosed by the above passages do not include any geometrical deformation functions that would provide positions of sampling points of signal warping grids within certain regions. Therefore, the cited sections of *Le Pennec* are irrelevant to claim 8.

SECTION 103 REJECTION OF CLAIM 12

Dependent claim 12 requires the additional limitation of "applying a bandeletisation to said warped wavelet packet coefficients and wavelet packet warping grids."

In rejecting claim 12, the examiner refers to *Le Pennec* as mentioning the use of a bandeletisation process. However, Applicant is not claiming to have invented the bandeletisation process. Applicant claims a specific application of the process to warped wavelet packet coefficients and wavelet packed warping grids. *Le Pennec* would not have disclosed or suggested such an application to one of ordinary skill in the art.

SECTION 103 REJECTION OF CLAIM 17

Dependent claim 17 recites the further limitation of quantizing the bandelet coefficients.

Again, Applicant is not claiming the general concept of quantization. Thus, the fact that one of ordinary skill in the art would have seen the word "quantization" at *Le Pennec*, col. 8, lines 2-5, would not have suggested to him the additional limitation of claim 17.

SECTION 103 REJECTION OF CLAIM 38

Independent method claim 38 recites a signal processing method that can be viewed as the inverse method of claim 1's method. Like claim 1's method, claim 38's method relies on "warped wavelet packet coefficients and wavelet packet warping grids," neither of which are suggested by *Le Pennec* and *Washizawa*. The comments made above with respect to claim 1 also apply to claim 38.

In addition, neither *Le Pennec* nor *Washizawa* suggests "applying an inverse warping operation" as claimed in step (c) of claim 38. Therefore, claim 38 and its progeny are allowable over the cited art.

SECTION 103 REJECTION OF CLAIM 49

Independent method claim 49 recites a signal decompression method. Steps (e) and (f) are the same as steps (b) and (c) of claim 38. Accordingly, claim 49 is patentable for at least the same reasons as discussed above in connection with claim 38.

In addition, steps (a)-(d) of claim 49 impose limitations on how the warped wavelet packet coefficients and wavelet packed warping grids are obtained in a signal decompression application. These steps rely on a warping geometry, warping grids and warped wavelet packet coefficients, none of which are taught or suggested by any of the cited references. Therefore, the method of claim 49 is patentable over the cited art.

SECTION 103 REJECTION OF CLAIM 72

In rejecting claim 72, the Examiner relies on arguments similar to those made in connection with claim 17. Accordingly, Applicant reasserts the arguments set forth in connection with claim 17, and maintains that claim 72 is patentable for at least the same reasons as claim 17.

In addition, the cited references fail to teach or suggest any structures similar to the claimed "geometrical segmentation and sampling section," the claimed "signal warping unit" and to the claimed "warped wavelet packet processor." For at least these reasons, claim 72 is patentable over the cited art.

SECTION 103 REJECTION OF CLAIM 73

Independent claim 73 recites a signal decoder having limitations similar to those recited in method claim 49. Accordingly, claim 73 is allowable for at least the same reasons as claim 49.

SECTION 103 REJECTION OF CLAIM 77, 78

Claims 77 and 78 recite computer program products having code instructions for performing the steps of claims 17 and 44, respectively. Accordingly, claims 77 and 78 are allowable for at least the same reasons as claims 17 and 44.

CONCLUSION

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

No fees are believed to be due in connection with the filing of this response. However, to the extent fees are due, or if a refund is forthcoming, please adjust our Deposit Account No. 50-4189, referencing Attorney Docket No. 35203-002US1.

Respectfully submitted,

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